Flora of Eniwetok Atoll[1]

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ENIWETOK ATOLL is near the north end of the Marshall Islands which form the northeastern part of Micronesia, in the tropical, central Pacific Ocean. The Marshall Islands were discovered in 1817 on the "Rurik" voyage under Captain Otto von Kotzebue. A member of the scientific staff of this voyage was the German botanist, Adelbert von Chamisso. He made extensive plant collections in the Marshalls and included them in his publications on the voyage. Though this voyage of discovery included landings on several of the atolls, Eniwetok itself was not visited.

There are no accounts of the flora of Eniwetok during the successive occupations of Micronesia by the Spanish, or by the Germans. Next in the succession of rulers were the Japanese. Their scientists made wide explorations of Micronesia, and particularly through the work of R. Kanehira and T. Hosokawa added much to the knowledge of the Micronesian flora. In August, 1934, Ohba made collections of several species of *Pandanus,* these being apparently the first botanical collections from Eniwetok Atoll. They were studied, and published upon, by Kanehira, and are preserved in the herbarium at Fukuoka, Japan.

In World War II, during the American conquest, in February, 1944, there was heavy bombardment and fighting on Eniwetok. This caused general devastation on the largest islet, Eniwetok Islet, and on several others. It probably exterminated some of the rarer plant species. During the occupation of Eniwetok by the American military forces, Major Edwin H. Bryan, Jr., visited the atoll in August, 1944. He collected plant specimens and made additional notes on the flora. These gave the first general summary of the flora of Eniwetok. They are now in the Bernice P. Bishop Museum, Honolulu.

In mid-May, 1946, the ship of the Economic Survey of Micronesia, U. S. Commercial Corporation, tarried in the Eniwetok lagoon. Large botanical collections were made for it by F. Raymond Fosberg and a small collection by Edward Y. Hosaka. These collections are preserved in the U. S. National Herbarium, Washington, D.C., and in the Bishop Museum.

Broad scientific studies began in the area in connection with the American atomic bomb testing program. The first test shot was at Bikini Atoll in 1946. Connected with this were the investigations accomplished by the Crossroads Expedition. On its staff was William Randolph Taylor. In late May, 1946, he made collections on several of the islets of Eniwetok. They are preserved in the U. S. National Herbarium, the University of Michigan Museum, and the Bishop Museum. The plants of Eniwetok were included in Taylor's book, *Plants of Bikini, and Other Northern Marshall Islands,* 1950.

During August, 1949, the ship of the L. R. Donaldson Expedition, U. S. Atomic Energy Commission, was the base for investigations of the lagoon and the islets. The writer, H. St. John, was the botanist and ecologist for the terrestrial flora. His numerous collections are in the Bishop Museum, the Smithsonian Institution, Washington, D.C., the University of Washington, Seattle, and elsewhere.

On August 1, 1956, S. C. Rainey collected on Rigili. His specimens were identified by F. R. Fosberg in Washington, D.C.

In August and September, 1957, Irwin E. Lane collected on several of the islets. His specimens are in the Bishop Museum.

In early August, 1958, St. John collected on several of the southern islets of the atoll. His collections are in the Bishop Museum, and the Marine Biological Laboratory, Eniwetok.

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LOCATION AND TOPOGRAPHY

Eniwetok Atoll is found near the northern end of the double chain of atolls forming the Marshall Islands. It is at 11° 30′ N., 162° 14′ E. Its shape is a broad ellipse, running NW to SE. Its length is 22 nautical mi. The reef is well developed and nearly continuous, but with several deep passages from the sea to the lagoon. The islets total 39, and nearly all of them and all the large ones lie on the northeastern or windward side. The largest islets are Eniwetok, Parry, Engebi, and Runit. Eniwetok, the largest, is 2¼ nautical mi. in length.

SIZE OF THE FLORA

Eniwetok is in the northern and drier section of the Marshall Islands. As a consequence it does not have, and probably never had, dense, lush, damp forests, nor is its total flora large. Its indigenous flora totals 42 species or minor taxa, of which 4 are endemic, all of these four being in the genus *Pandanus*. The total of adventive weeds is 27, and that of cultivated plants, including both food crops and ornamentals is 26. Species known only by drifted seeds on the beaches total 7. All together the living flora totals 95 species or minor taxa.

Seeds or fruits found in the jetsam on the sea and lagoon beaches add an element in the flora. Many come from species growing on the islets of the atoll, but there are others from species unknown on the island and certainly floated on the sea currents or waves from distant regions. Of these *Hernandia sonora* is the only one that is native to other islands of the Marshall group, ones to the south in the wetter belt. Two species, *Caesalpinia Bonduc* and *Aleurites moluccana,* are of wide occurrence and could have come from the northeast, south, or west. These are both abundant in Hawaii. Two species, *Mucuna urens* and *Sapindus Saponaria,* must have come from the northeast, being abundant in Hawaii and absent in other parts of the tropical Pacific. Two species, *Dioclea reflexa* and *Entada phaseoloides,* must have come from the south or west. In sum, of the 6 drift species, 4 certainly floated from Hawaii on the Japan Current which regularly flows past Hawaii towards the Marshalls and the central Pacific. The two species of southern or western origin may have travelled eastward on the Equatorial Counter Current and have been wafted northward during a southerly storm.

ECOLOGY

Details of the terrestrial plant ecology were reported to the Atomic Energy Commission in 1950. They were for publication in UWFL-24.

Because of the dryness and the small, mostly narrow, islets, there is little diversity in the habitats. There are no good sand dunes, or fresh ponds, or central hollows with rich, black humus top soil. The only habitats are: outer beaches of coral rock or coral gravel, inner beaches of coral sand, small coral sand dunes, coral gravel flats, and coral sand flats. Some of the plants seem restricted to a particular habitat, but the zones formed are rather indefinite. Their occurrence seems governed not so much by the soil, as by the size of the islet and the distance from the sea which seems to determine the shelter from salt spray, and the availability of fresh water in the water table. Since the habitat differences are slight, they have, for the sake of brevity, been omitted in the descriptive flora which follows, except when special and very local. In this flora every known collection is briefly cited with its islet, date of collection, and collector's name and the number. From this, future research workers can learn the former occurrence of each species, and the date for each record. This chronological information is of value, since it appears that each atomic bomb explosion has restricted, or may restrict, the occurrence of, or exterminate some members of, the flora.

ACKNOWLEDGMENTS

The author's sincere thanks are due Dr. Lauren R. Donaldson of the Radiation Biological Laboratory, University of Washington, Seattle 5, Washington, and Dr. Leonard D. Tuthill, then dean of the Graduate School, University of Hawaii, Honolulu 14, Hawaii, for making possible the writer's two explorations of Eniwetok.

PURPOSE

This account of the flora of Eniwetok is prepared in the form of a brief manual. It summarizes the flora, and it gives keys and brief descriptions to make possible the identification in the field of any of its plant species. Many types of research are being carried on now on the atoll. The investigators have diverse training and come from widely separated institutes. When their researches touch the terrestrial flora this manual will enable them to determine with certainty the identity of the plants.

KEY TO SPECIES

PTERIDOPHYTA

1. Plants lacking flowers, reproducing by spores; frond pinnately lobed..1. *Phymatodes Scolopendria*
1. Plants with flowers, reproducing by seeds,

SPERMATOPHYTA

2. Flower parts in 3's; leaves parallel veined; herbs, and trees but these without secondary wood,

MONOCOTYLEDONES

3. Trees,
   4. Fruits aggregate into heads 15 cm. or more in length,
      5. Carpel apices concave,
         6. Phalanges 7.5–8 cm. long,
            7. Inner apical sinuses 2–3 mm. deep; syncarps globose..2. *Pandanus brachypodus*
            7. Inner apical sinuses 1–2 mm. deep; syncarps ellipsoid.....3. *P. enchabiensis*
         6. Phalanges 6.5 cm. long; sinuses 2–3 mm. deep.....8. *P. rectangulatus*
      5. Carpel apices all, or at least the inner ones, convex or conical,
         8. Phalanges 7–9 cm. long,
            9. Inner apical sinuses 1–2 mm. deep; outer carpels much the larger.....7. *P. pulposus*
            9. Inner apical sinuses 3–6 mm. deep; outer carpels not much the larger,
               10. Phalanges 7–7.9 cm. long; tips of outer carpels conic and slightly divergent.....9. *P. rhombocarpus*
               10. Phalanges 9 cm. long; tips of carpels pyramidal-semiorbicular, ascending.....10. *P. Utiyamai*
         8. Phalanges 5.5–6.5 cm. long,
            11. Phalanges 6-6.5 cm. long; inner apical sinuses 6–7 mm. deep.....4. *P. korrorensis*
            11. Phalanges 5–6 cm. long; inner apical sinuses much shallower,
               12. Carpel apices rounded conic; phalange apices mostly convex; lateral sutures deep.....6. *P. odoratissimus* var. *novo-guineensis*
               12. Carpel apices truncate to low rounded; phalange apices mostly truncate; lateral sutures lacking or few and shallow.....5. *P. odor.* var. *novo-caledonicus*
   4. Fruit of single, 1-celled nuts, with edible white meat and potable water.....30. *Cocos nucifera*
3. Herbs,
   13. Blade deeply lobed; umbel with dangling, threadlike, sterile branches.....33. *Tacca Leontopetaloides*
   13. Not so,
      14. Sepals 3; petals 3; ovary 3-celled,
         15. Ovary superior; leaves linear, terete.....31. *Allium Cepa*
         15. Ovary inferior; leaves broad strap-shaped, 7–10 cm. broad.....32. *Crinum asiaticum*

14. Perianth none or of dry scales, these often in 2 ranks,
16. Stems terete, jointed, mostly hollow; leaves 2-ranked; anthers versatile,
17. Spikelets 1–many-flowered, laterally compressed; articulation above the glumes,
18. Spikelets sessile on a continuous rhachis,
19. Spikelets opposite; spike terminal, solitary,
20. Spike 1.2–1.5 mm. thick.....19. *Lepturus repens* var. *repens*
20. Spike 1.7–2 mm. thick.....20. *L. repens* var. *occidentalis*
19. Spikelets on only one side of the rhachis; spikes usually several, digitate or racemose,
21. Spikelets with more than 1 perfect flower,
22. Rhachis of spike extending beyond the spikelets.....15. *Dactyloctenium aegyptium*
22. Rhachis of spike not prolonged.....17. *Eleusine indica*
21. Spikelets with only 1 of the florets perfect,
23. Spikelets without additional modified florets; rhachilla prolonged behind the palea.....14. *Cynodon Dactylon*
23. Spikelets with 1 or more upper modified florets.....13. *Chloris inflata*
18. Spikelets pediceled in open panicles; lemmas 3-nerved.....18. *Eragrostis amabilis*
17. Spikelets with 1 perfect terminal floret and 1 staminate or rudimentary one below; spikelets dorsally compressed; articulation below the spikelet,
24. Glumes and sterile lemma membranous,
25. Spikelets borne from the one furrowed side of the rhachis; plant creeping.....23. *Thuarea involuta*
25. Spikelets not so; plant erect,
26. Spikelets subtended or surrounded by bristles or spines,
27. Bristles connate at base, falling with the burlike spikelet,
28. Spikelets 5–6 mm. long; involucre pilose; first glume present.....12. *Cenchrus echinatus*
28. Spikelets 4 mm. long; involucre puberulous; first glume wanting.....11. *C. Brownii*
27. Bristles distinct, persisting on axis; spikelets discoid, falling free of the bristles.....21. *Setaria verticillata*
26. Spikelets not subtended by bristles,
29. Glumes and sterile lemma awned; spikelets long-silky.....25. *Tricholaena repens*
29. Glumes and sterile awnless,
30. Spikelets long-silky, in panicles; fruit lanceolate, acuminate.....24. *Tricachne insularis*
30. Spikelets short pubescent or glabrous; fruit elliptic; racemes quite or nearly digitate.....16. *Digitaria pruriens*
24. Glumes indurate; fertile lemma and palea hyaline or membranous; sterile lemma like the fertile one,
31. Spikelets unisexual, in separate inflorescences; individual ovaries naked.....25. *Zea Mays*
31. Spikelets in pairs or threes, one sessile and perfect, the others pedicelled and staminate.....22. *Sorghum bicolor* var. *technicum*

16. Stems triangular, solid; leaves 3-ranked; anthers basifixed,
32. Floral scales 2-ranked, laterally compressed,
33. Spikelets lanceolate; blades nodulose....27. *Cyperus javanicus*
33. Spikelets linear; blades not nodulose....28. *C. odoratus*
32. Floral scales spiral, merely concave....28. *Fimbristylis atollensis*

2. Flower parts in 5's (rarely in 4's); leaves netted veined; herbs, shrubs, or if trees with secondary wood.

DICOTYLEDONES

34. Leafless, cordlike parasites....48. *Cassytha filiformis*
34. Not so,
35. Perianth in 1 series or apparently so,
36. Leaves opposite,
37. Stipules present,
38. Ovary 3–4-celled,
39. Florets in heads surrounded by a calyxlike involucre; sap milky,
40. Stems prostrate; blades less than 1 cm. long....63. *Euphorbia thymifolia*
40. Stems erect; blades larger,
41. Blades glabrous; plant forming tufts....61. *E. Chamissonis*
41. Blades hirsute; stems simple....62. *E. hirta*
39. Flowers not in involucrate heads,
42. Outer stamens opposite the sepals; blades oblong-obovate, unlobed....64. *Phyllanthus amarus*
42. Outer stamens alternate with the sepals; blades suborbicular, deeply palmately lobed....65. *Ricinus communis*
38. Ovary 1-celled; fruit an achene....35. *Fleurya ruderalis*
37. Stipules none,
43. Perianth deeply 3–5-parted, dry, scarious,
44. Style single; stigma capitate,
45. Perianth 5 mm. long; blades rough hairy....37. *Achyranthes aspera*
45. Perianth 5.5–6.5 mm. long; blades soft silky hairy....38. *A. velutina*
44. Styles 2–3,
46. Sepals 3; pod not splitting at maturity....40. *Amaranthus viridis*
46. Sepals usually 5; pod splitting at maturity....39. *A. dubius*
43. Perianth funnelform, petaloid,
47. Tree; fruit with gland-tipped, spiny, longitudinal ridges....44. *Pisonia grandis*
47. Herbs; fruit not spiny ridged,
48. Flowers axillary, solitary, 2.5–5 cm. long....43. *Mirabilis Jalapa*
48. Flowers less than 5 mm. long, in terminal spikes,
49. Calyx tube glandular; stamens 2–3....41. *Boerhavia diffusa* var. *diffusa*
49. Calyx tube glabrous; stamens 3–6....42. *B. diffusa* var. *tetrandra*
36. Leaves alternate,
50. Fruits juicy, fused into a head; tree....34. *Artocarpus incisus*
50. Fruits dry capsules, distinct,
50A. Herbs (Turn back to the first no. 37.)
50A. Trees; fruit an achene enclosed in a loose, fleshy envelope....48a. *Hernandia sonora*
35. Perianth in 2 series or apparently so,
51. Parts of the inner perianth series all or all but 2 separate or united only at the very base,

52. Stamens more than twice as many as the petals,
  53. Leaves opposite,
    54. Stipules present,
      55. Sepals 2; ovary 1-celled,
        56. Leaves terete.....47. *Portulaca samoënsis*
        56. Leaves flattened,
          57. Petals 2–4 mm. long, closing at noon; leaves wedge-shaped.....46. *P. oleracea*
          57. Petals 10–12 mm. long, closing at 3 P.M.; leaves obovate to orbicular.....45. *P. lutea*
      55. Sepals more than 2; ovary several-celled,
        58. Ovary partly inferior; fruit smooth, with single seed germinating while still on the tree.....71. *Rhizophora Mangle*
        58. Ovary superior; capsules spiny; seeds germinating after falling.....66. *Triumfetta procumbens*
    54. Stipules absent; filaments united into a tube,
      59. Involucral bracts 3–1; ovule ascending.....67. *Malvastrum coromandelianum*
      59. Involucral bracts none; ovule pendulous or horizontal.....68. *Sida fallax*
  53. Leaves alternate.....60a. *Aleurites moluccana*
52. Stamens twice as many as petals or less,
  60. Ovary inferior, 1-celled; trees,
    60A. Sepals and petals 4–5; ovules 2–5; stamens 10.....72. *Terminalia samoensis*
    60A. Sepals and petals 3; ovule 1; stamens 3–4.....48a. *Hernandia sonora*
  60. Ovary superior,
    61. Leaves compound,
      61A. Trees; fruits globose.....65a. *Sapindus Saponaria*
      61A. Vines or herbs,
        62. Leaves opposite; ovary 5–6-celled, in fruit each coccus 2-horned.....59. *Tribulus cistoides*
        62. Leaves alternate; ovary 1-celled, unarmed,
          62A. Flowers regular; pods dehiscing into 1-seeded joints; seeds 4–5 cm. in diameter.....54. *Entada phaseoloides*
          62A. Flowers papilionaceous; pods dehiscing longitudinally; seeds smaller,
            63. Pod septate internally between the seeds.....55. *Mucuna urens*
            63. Pods not thus septate,
              64. Keel of corolla spiral.....56. *Phaseolus vulgaris*
              64. Keel not spiral,
                64A. Flowers with 4 petals regular, 1 slightly the larger; pods prickly.....52a. *Caesalpinia Bonduc*
                64A. Flowers papilionaceous; pods smooth,
                  65. Style bearded towards the summit; upper stamen free.....58. *Vigna marina*
                  65. Style beardless near tip,
                    66. Calyx asymmetric from much enlarged upper lip; seeds beanlike; upper stamen connate to the middle.....54. *Canavalia microcarpa*
                    66. Calyx nearly symmetric; seeds compressed quadrate.....53a. *Dioclea reflexa*
    61. Leaves simple; shrubs or trees,

67. Stipules present; petals white.....70. *Pemphis acidula*
67. Stipules absent,
68. Carpels several, dry, separate; petals yellow, glabrous.....
.....60. *Suriana maritima*
68. Carpels 1 and single, or compound,
69. Columnar, fleshy trees with palmately dissected blades.....
.....69. *Carica Papaya*
69. Not as above,
70. Stamens 6; petals 4, glabrous,
71. Pod terete, indehiscent, beaked; leaves pinnatifid.....
.....52. *Raphanus sativus*
71. Pod flattened, dehiscent; leaves entire,
72. Leaves fleshy, glaucous; sepals erect.....
.....49. *Brassica oleracea* CV *capitata*
72. Leaves thin, greenish; sepals spreading.....50. *B. pekinensis*
70. Stamens 8; petals 4, villous within.....36. *Ximenia americana*
51. Inner perianth series connate,
73. Ovary inferior,
74. Stipules present; trees,
75. Drupes fully united into compound, soft fruits.....83. *Morinda citrifolia*
75. Drupes remaining separate, firm, subglobose.....82. *Guettarda speciosa*
74. Stipules none,
76. Vines climbing by tendrils,
77. Corolla white.....87. *Lagenaria siceraria*
77. Corolla yellow,
78. Corolla lobed half way.....86. *Cucurbita maxima*
78. Corolla lobed nearly to the base,
79. Tendrils branched.....84. *Citrullus vulgaris*
79. Tendrils unbranched.....85. *Cucumis Melo*
76. Not so,
80. Flowers separate; corolla slit down upper side,
81. Leaves glabrous.....88. *Scaevola frutescens* var. *frutescens*
81. Leaves appressed pilosulous.....89. *S. frut.* var. *sericea*
80. Flowers assembled in involucrate heads,
82. Heads containing only ray flowers; sap milky.....91. *Lactuca sativa*
82. Heads with some or all of the flowers disk flowers,
83. Disk flowers the only ones present,
84. Corollas 5-parted; flowers all perfect, fertile.....94. *Vernonia cinerea*
84. All corollas except the central ones filiform, truncate, fertile,
85. Blades oblanceolate, serrate or denticulate, 2.5–3.7 cm. long.....
.....92. *Pluchea indica*
85. Blades 10 or more cm. long, oblance-elliptic to lanceolate, entire or nearly so.....93. *P. odorata*
83. Disk flowers at the center, ray flowers on the margin of the head,
86. Ray flowers minute, not longer than the bracts.....
.....90. *Erigeron bonariensis*
86. Ray flowers larger and conspicuous,
87. Blades sessile, entire; involucral bracts in several series.....
.....96. *Zinnia elegans*
87. Blades petioled, serrate; involucral bracts in 2 series.....
.....95. *Wedelia biflora*

73. Ovary superior,
88. Leaves in whorls of 3; tree with milky sap.....73. *Ochrosia oppositifolia*
88. Leaves alternate,
89. Ovules 1–2 in each cell,
90. Herbaceous vines,
91. Night-bloomer; corolla white.....76. *Ipomoea tuba*
91. Day-bloomer; corollas bluish to pinkish,
92. Blades cordate; flowers opening blue; plant not halophytic.....75. *I. purpurea*
92. Blades emarginate or rarely obtuse or acute; flowers opening pink; plant of salty shores.....74. *I. pes-caprae* subsp. *brasiliensis*
90. Trees,
93. Corolla white, about 5 mm. long; blades silky hairy.....78. *Messerschmidia argentea*
93. Corolla orange, about 4 cm. long; blades nearly glabrous.....77. *Cordia subcordata*
89. Ovules several to many in each cell,
94. Fruit a capsule.....79. *Nicotiana glauca*
94. Fruit a berry,
95. Anthers connivent around the style; berry red, exposed.....81. *Solanum Lycopersicum*
95. Anthers not connivent; berry yellowish, enclosed in the papery, enlarged calyx.....80. *Physalis angulata* var. *angulata*

FLORISTIC TREATMENT

PTERIDOPHYTA

POLYPODIACEAE

1. *Phymatodes Scolopendria* (Burm.) Ching; *Polypodium Phymatodes* L.; *Microsorium Scolopendria* (Burm.) Copel. "Kino." Rhizome scaly, pale, creeping on the ground; fronds remote; stipes 15–35 cm. long, dark; fronds 30–50 cm. long, ovate, firm, deeply pinnatifid; sori naked, round to elliptic, in a single row on either side of the midrib of the lobe.

Recorded for Eniwetok Atoll only in the field observations in 1944 of E. H. Bryan, Jr.

SPERMATOPHYTA

MONOCOTYLEDONES

PANDANACEAE

2. *Pandanus brachypodus* Kanehira. "Punmusi." Tree; leaves 180 × 6.5 cm., the margins denticulate, the teeth near the tip 1 mm. long, 3 per cm., the lower ones more distant, only near the middle are the teeth lacking; midrib unarmed below at base, armed above; heads 17 × 16 cm., nearly globose, of about 43 phalanges, these 7.5 cm. long, obovate, the apex truncate; carpels 5–6, the inner ones much the smaller, the apices concave, the inner sinuses 2–3 mm. deep.

Engebi: by the holotype collection (as Enchabi I.), August, 1934, *Hosino A 7* (*Kanehira 3,480*). Japtan: 6 August 1958, *St. John 26,303*.

3. *Pandanus enchabiensis* Kanehira. "Maok." Tree; fruiting head 24 × 18–20 cm.; ellipsoid, of about 50 phalanges, these 8 × 5 cm., obpyriform, the apex truncate; carpels 5–6, the inner ones much the smaller, the apices concave, the inner sinuses 1–2 mm. deep.

Engebi: (as Enchabi I.), August, 1934, *Ohba* (*Hosino A 15*), (*Kanehira 2,470*), holotype.

4. *Pandanus korrorensis* Kanehira. "Bop." Leaves 120 × 9 cm., the midrib denticulate below, the margins denticulate, the teeth near the apex 1 mm. long, towards the base larger and more remote; fruiting head 17 × 15 cm., broad ellipsoid, of about 70 phalanges, these 6–6.5 × 3 cm., obpyriform, the apex profile rounded; carpels 5–10, subequal, the apices depressed conic, the inner sinuses 6–7 mm. deep.

Runit: 15 August 1949, *St. John 23,841.* The vernacular name "bop" applies to all *Pandanus.* The holotype was from Palau, Korror, July, 1933, *Nisida 3,348.*

5. *Pandanus odoratissimus* L. f. var. *novocaledonicus* (Martelli) St. John. "Bop." Tree 8 m. × 30 cm.; leaves 130–140 × 9 cm., the midrib below denticulate, the margins denticulate, the teeth towards the tip 1 mm. long, close and fine, towards the base the teeth larger and more remote; phalanges 5.2–5.5 × 3.8 cm., obpyriform, the apex truncate; carpels 3–10, subequal, the apices low convex, the inner sinuses 4–5 mm. deep.

Runit: 15 August 1949, *St. John 23,840.*

6. *Pandanus odoratissimus* L. f. var. *novoguineensis* (Martelli) St. John. "Bop." Tree 7–8 m. × 20 cm.; leaves 115–150 × 5–8 cm., the midrib denticulate below, the margins denticulate, the teeth 1 mm. long and 3–4 per cm. towards the tip, 2 mm. long and more remote towards the base; phalanges 5.2–6 × 3.4–3.6 cm., broad cuneate, the apex low convex; carpels 3–12, usually 7–8, the central ones a little smaller, the apices low convex, the central sinuses 3–4 mm. deep.

Rujoru: 13 August 1949, *St. John 23,811.* Runit: 15 August 1949, *St. John 23,842.* Japtan: 12 September 1957, *Lane 57-136.*

7. *Pandanus pulposus* (Warb.) Martelli. "Jilebar." Tree; leaves 230 × 8 cm., the margins and midrib below armed; fruiting head 33 × 22 cm., ellipsoid, of more than 60 phalanges, these 5–8 × 5–6 cm., broad obpyriform, the apex low dome-shaped; carpels 7–12, the central ones a little smaller, the apices low convex, the central sinuses 3–4 mm. deep.

Aniyaanii: 7 August 1949, *St. John 23,715.* Japtan: 5 February 1955, *Doty 12,779.* Rigili: 11 September 1957, *Lane 57-135;* 10 August 1949, *St. John 23,753.*

8. *Pandanus rectangulatus* Kanehira. "Patchaplip"; "Olivo"; "Desmesyô"; "Anilip"; "Parkup." Tree; leaves 170 × 7 cm., the midrib remotely denticulate below, the margins denticulate, near the tip the teeth 1 mm. long, the teeth about 1 per cm.; fruiting heads 20.5 × 10–15 cm., solitary, pendulous, broad ellipsoid, of 40–45 phalanges, these 6.5 × 5 cm., broad obpyriform, truncate; carpels 5–8, subequal, the apices slightly convex and with a central hollow 0.5–1 mm. deep, the central sinuses 2–3 mm. deep.

Engebi: (as Enchabi I.), the lectotype is September, 1934, *Ohba (Kanehira) 3,469* (Hb. Fukuoka); also nos. *3,473; 3,477;* and *3,479.* Japtan: 6 August 1958, *St. John 26,302.*

9. *Pandanus rhombocarpus* Kanehira. "Papparawa." Tree; fruiting heads 22 × 17 cm., solitary, pendulous, ellipsoid-globose, of more than 77 phalanges, these 7–7.9 × 3.5–4.2 cm., narrow pyriform, the apex subtruncate, with strong lateral sutures running halfway down; carpels 6–8, the central ones much the smaller, the apices subpyramidal, the outer ones distinctly curving salient, the central sinuses 3–6 mm. deep.

Engebi: (as Enchabi I.), holotype, August, 1934, *Ohba (Hosino A.5), (Kanehira 3,467).*

10. *Pandanus Utiyamai* Kanehira. "Bop." Tree 7 m. × 20 cm.; leaves 160–180 × 6–9.5 cm., swordlike, tapering, the margins closely spine-toothed, near the middle being 1 mm. long and 3 per cm., teeth near the base 2 mm. long and 2 per cm.; fruiting heads 25–26 × 20 cm., ellipsoid-subglobose, solitary, of about 80 phalanges, these 9 × 4.5 cm., obpyriform, with lateral angles, the apex low convex; carpels 8–12, subequal, the apices rounded-subpyramidal, the central sinuses 3–4 mm. deep.

Rujoru: 13 August 1949, *St. John 23,810.* The holotype is from Ponape, August 1933, *Hosino & Utiyama 24 (Kanehira 2,809).*

GRAMINEAE

11. *Cenchrus Brownii* R. & S. Short-lived plant 30–100 cm. tall, sheaths glabrous; blades 10–30 cm. long, 6–15 mm. wide; racemes 5-12 cm. long, dense; burs depressed globose, the outer bristles numerous, basal, slender; spikelets 4–5 mm. long lanceolate. Introduced weed.

Runit: 24 May 1946, *Taylor 46-1,259;* 15 August 1949, *St. John 23,845.* Eniwetok: 6 August 1949, *St. John 23,711.*

12. *Cenchrus echinatus* L. "Legalek." Plant, 15–75 cm. tall, single or in small tufts; leaf sheaths smooth; blades 7–13 cm. × 3–8 mm., slightly hairy at base; fruiting raceme 3–10 cm. long; spikelets forming burs covered with retrorsely barbed bristles. Introduced weed, abundant and troublesome in disturbed soils.

Engebi: 18 May 1946, *Fosberg 24,378;* 12 August 1949, *St. John 23,783.* Rujoru: observed in 1949, *St. John.* Runit: 24 May 1946, *Taylor 46-1,255;* 15 August 1949, *St. John 23,844.* Japtan: rare, 15 May 1946, *Fosberg 24,324;* May 1946, *Taylor 46-1,289;* observed 1949, *St. John.* Eniwetok: occasional, 13 May 1946, *Fosberg 24,300;* observed, abundant, 1949, *St. John.* Rigili: 1 August 1956, *Rainey.*

13. *Chloris inflata* Link. Slender grass; stems 25–70 cm. tall, erect, erect or often stooling with the base decumbent and rooting at the nodes; sheaths glabrous; cauline blades 6–15 cm. long, 2.5–4 mm. wide, scabrous; the 9–14 spikes digitate, 3.5–9 cm. long; spikelet body 2 mm. long; callus hispid barbate; lemmas with awns 4–6 mm. long; lemma of upper floret globose inflated. Introduced weed.

Engebi: 18 May 1946, *Fosberg 24,407;* 12 August 1949, *St. John 23,784* and *23,782.* Eniwetok: observed 1949, *St. John.*

14. *Cynodon Dactylon* (L.) Pers. Creeping, mat-forming; leaf sheaths smooth; blades 2.5–5 cm. × 2–4 mm.; flowering stems 10–40 cm. tall, smooth; spikes 2–6, digitate, 2–7 cm. long; spikelets 2 mm. long, lanceolate; lemma ciliate on the keel. Deliberately introduced, as lawn grass, and as sand binder.

Eniwetok Atoll: observed 1944, *Bryan.* Engebi: May 1946, *Fosberg 24,397.* Parry: 9 August 1958, *St. John 26,312.* Eniwetok: 13 May 1946, *Fosberg 24,292;* observed 1949, *St. John.*

15. *Dactyloctenium aegyptium* (L.) Aschers. & Schweinf. Short-lived herbaceous grass, 10–30 cm. tall; leaf sheaths glabrous, loose, crowded; blades 3–15 cm. × 2–6 mm., ciliate towards the base; spikes 2–5 cm. long, 2–6 in number, digitate; spikelets 3 mm. long, flat, ovate, acute, 3–5-flowered; glumes scabrous on the keel, the upper one short awned. Introduced weed, by roadside.

Parry: 6 August 1958, *St. John 26,301.*

16. *Digitaria pruriens* (Trin.) Buese. Short-lived grass making small tufts; leaf sheaths pilose; blades 8–15 cm. × 4–13 mm., smooth on both surfaces except at base; stems 30–90 cm. tall; spikes 5–10, digitate, 7–10 cm. long, erect; spikelet 4 mm. long, lanceolate; second glume less than 1 mm. long, hairy on the margins. Introduced weed.

Engebi: observed 1949, *St. John.* Japtan: 27 May 1946, *Taylor 46-1,293.*

17. *Eleusine indica* (L.) Gaertn. Long-lived grass, forming erect clumps; stems 20–100 cm. long; leaf sheaths smooth except at upper margin; blades 15–30 cm. × 4–7 mm., only the upper side with scattered hairs; stalks 30–75 cm. tall; flowering spikes 2–8 digitate or aproximate, spreading; spikelets 3–7-flowered, about 6 mm. long, the glumes and lemmas scabrous on the nerves. Introduced weed.

Engebi: observed 1944, *Bryan;* 18 May 1946, *Fosberg 24,384.* Runit: 24 May 1946, *Taylor 46-1,257;* 15 August 1949, *St. John 23,853.* Japtan: 15 May 1946, *Fosberg 24,320;* 27 May 1946, *Taylor 46-1,280.* Parry: 6 August 1958, *St. John 26,300.* Eniwetok: 13 May 1946, *Fosberg 24,289;* observed 1949, *St. John.*

18. *Eragrostis amabilis* (L.) Wight & Arn. "Wujoich." Delicate short-lived grass forming erect tufts 15–30 cm. tall; leaf sheaths glabrous below, long ciliate above; blades 3–9 cm. × 2–4 mm. glabrous; inflorescence a panicle 5–15 cm. long, loose; spikelets 1.5 mm. long, 4–6-flowered; glumes 1 mm. long, lanceolate, the keel hairy. Common, but apparently an introduced weed.

Bogon: 11 August 1949, *St. John 23,772.* Engebi: 18 May 1946, *Fosberg 24,387;* observed 1949, *St. John.* Aomon: 16 May 1946, *Fosberg 24,347;* 4 June 1946, *Taylor 46-1,294;* observed 1949, *St. John.* Biijiri: 14 August 1949, *St. John 23,824.* Runit: 24 May 1946, *Taylor 46-1,256 and 46-1,268.* Parry: in 1957 *Lane 57-104.* Aniyaanii: 25 August 1957, *Lane 57-116.* Japtan: 15 May 1946, *Fosberg 24,344;* 27 May 1946, *Taylor 46-1,294,* observed 1949 *St. John.* Rigili: 10 August 1949, *St. John 23,743;* 1 August 1956, *Rainey;* 11 September 1957, *Lane 57-132.*

19. *Lepturus repens* (Forst. f.) Rr. Br. var. *repens.* "Ujos aitok." Long-lived grass forming clumps in dry places, but trailing runners in wet places; leaf sheaths glabrous or glabrate; blades 5–40 cm. × 2–8 mm., flat or folded, smooth or short hairy, flower spike single, 3–20 cm. long, 1.2–1.5 mm. thick; spikelets 3.5–4 mm. long, 2–3-flowered, awned or not; glumes firm, 5- or more-veined; lemma 3–6 mm. long. The commonest native grass.

Engebi: 18 May 1946, *Fosberg 24,395;* observed 1949, *St. John.* Aitsu: observed 1949, *St. John.* Rujoru: 13 August 1949, *St. John 23,800.* Aomon: 16 May 1946, *Fosberg 24,353;* observed 1949, *St. John.* Biijiri: 14 August 1949, *St. John 23,820.* Runit: 15 August 1949, *St. John 23,854.* Japtan: 15 May 1946, *Fosberg 24,325;* observed 1949, *St. John.* Parry: observed 1944, *Bryan;* 15 May 1946, *Fosberg 24,325.* Parry: observed 1944, *Bryan;* 1957, *Lane 57-102.* Jieroru: 21 May 1946, *Taylor 46-1,241;* Eniwetok: 13 May 1946, *Fosberg 24,298;* observed 1949, *St. John.* Igurin: observed 1949, *St. John;* 6 September 1957, *Lane 57-126.* Mui: 9 August 1958, St. John *26,317.* Rigili: observed 1949 *St. John;* 1 August 1956, *Rainey.*

20. *Lepturus repens* (Forst. f.) R. Br. var. *occidentalis* Fosberg. Differing in having the spikes usually 1.7–2 mm. thick; glumes 10–15 mm. long, acute-acuminate to subulate-acuminate.

Bogon: 31 May 1946, *Taylor 46-1,315;* 11 August 1949, *St. John 23,766.*

21. *Setaria verticillata* (L.) Beauv. Short-lived grass, tufted, erect or decumbent at base, 30–75 cm. tall; leaf sheaths smooth; blades 15–25 cm. × 5–12 mm., flat, scabrous above; spikes 5–7.5 cm. long, erect; spikelet bristles numerous, downward barbed, remaining attached to the axis; spikelets in clusters, 1-flowered, oval, 2 mm. long; outer glume less than half as long as spikelet. Introduced weed, abundant in disturbed soil near settlements.

Engebi: 18 May 1946, *Fosberg 24,392.* Japtan: 27 May 1946, *Taylor 46-1,288;* 15 May 1946, *Fosberg 24,327.* Eniwetok: observed 1949, *St. John.* Eniwetok Atoll: observed August, 1944, *Bryan.*

22. *Sorghum bicolor* (L.) Moench. var. *technicum* (Koern.) Jav. Culm stout 2–4 m. tall; blades up to 1 m. × 8 cm.; panicle 30–80 cm. long, its branches simple for 15–50 cm. and smooth; sessile spikelets 4.5–6 mm. long, obovate-elliptic; upper lemma usually with an awn up to 10 mm. long; grains 3.5–4 mm. long, mahogany red. Cultivated crop grain.

Engebi: May, 1944, observed, *Fosberg.* Runit: 30 May 1946, *Taylor 46-1,305.*

23. *Thuarea involuta* (Forst. f.) R. & S. "Ujos maroro." Perennial, low trailing grass, with long runners; leaf sheaths glabrous or puberulent; blades 3–7 cm. × 4–7 mm., thick, puberulent to glabrate; flower spike, 1-sided, 1–4 cm. long, enclosed in a folded spathe, the axis channeled, puberulent; spikelets 3–4 mm. long, 2-flowered; outer glume 4 mm. long, 5-veined, puberulent. Local, uncommon, found on or near the sea beaches.

Aaraanbiru: 10 April 1954, *Palumbo 1,127.* Aomon: 16 May 1946, *Fosberg 24,354;* observed 1949, *St. John.* Runit: 24 May 1946, *Taylor 46-1,262;* 15 August 1949, *St. John 23,846.* Japtan: 15 May 1946, *Fosberg 24,341;* 12 September 1957, *Lane 57-142;* Eniwetok: 13 May 1946, *Fosberg 24,295.*

24. *Tricachne insularis* (L.) Nees. Clump-forming grass 1–1.5 m. tall; sheaths sparsely hirsute; blades 20–40 cm. long, 8–15 mm. wide; panicle terminal, of racemes 10–15 cm. long; spikelets 4 mm. long, densely silky white villous, in pairs; second glume and sterile lemma 3–5-nerved. Introduced weed.

Japtan: 15 May 1946, *Fosberg 24,328;* observed 1949, *St. John;* 12 September 1957, *Lane 57-138.*

25. *Tricholaena repens* (Willd.) Hitchc. *Rhynchelytrum repens* (Nees) Stapf. & Hubb. ex Bews. Short-lived grass, tufted, 30–60 cm. tall; leaf sheaths sparsely pilose; blades 7–15 cm. long, 3–5 mm. wide, linear, rough on both surfaces and on margins, sparsely pilose; panicle light purplish pink when young; spikelets villous; grain 2 mm. long, elliptic, dark. An introduced weed.

Japtan: 27 May 1946, *Taylor 46-1,296.*

26. *Zea Mays* L. Short-lived, coarse grass, 1–4 m. tall, often with prop roots; leaf sheaths glabrous or puberulent; blades 60–100 × 3–6 cm.; staminate flowers in a terminal tassel, the florets 7–8 mm. long, 2 at each node, 1 of them pedicelled, 2-flowered; pistillate spikelets enwrapped in an ear, with the long styles protruding, the ovaries in 8–24 rows.

Engebi: once cultivated, observed 1944, *Townes.*

CYPERACEAE

27. *Cyperus javanicus* Houtt. "Wujoet in ion buil." *C. pennatus* Lam. Tufted perennial sedge,

30–70 cm. tall; leaves slightly longer than the stem, 5–12 mm. wide, scabrous on margin and midvein; bracts of inflorescence several, unequal, the longest 40–90 cm. long; umbel of 6 or more rays 6–9 cm. long, spikelets 5–13 mm. long, numerous, thick, little compressed; scales 7–12, and 3 mm. long, broadly ovate, reddish brown; achenes 1 mm. long, triangular, dark brown. Probably of aboriginal introduction.

Japtan: 12 September 1957, *Lane 57-145.*

28. *Cyperus odoratus* L. "Ujoet." Coarse, short-lived herb, 15–120 cm. tall; leaves nearly as long, and 2–12 mm. wide, flat; involucral leaves much longer than the rays; umbels simple or compound; spikelets 19–25 mm. long, 5–20-flowered; scales 2–3.5 mm. long; rhachilla disjointing, with wings clasping the achenes, these 1.5–2 mm. long, ellipsoid, triangular, gray to blackish. Introduced weed, wet places.

Japtan: 12 September 1957, *Lane 57-141.*

29. *Fimbristylis atollensis* St. John. "Berelitchman." Densely tufted perennial; stems 25–60 cm. tall, glabrous; leaves all basal, 2–38 cm. × 0.5–2.8 mm., rigid, channeled, the margin serrulate; inflorescence with leafy bracts 5–30 mm. long, the rays 3–8, smooth, 0.2–4 cm. long, simple or branched; spikelets 3–7 mm. long, lance-ovoid, mostly clustered, brown, several flowered; scales 1.2–1.7 mm. long, glabrous; achenes 0.5–0.6 mm. long, turbinate, planoconvex, brown. Native sedge, abundant on most habitats.

Bogombogo: 31 May 1946, *Taylor 46-1,311.* Bogon: 11 August 1949, *St. John 23,771.* Engebi: 21 August 1944, *Bryan.* Aomon: observed 1949, *St. John.* Runit: 15 August 1949, *St. John 23,849.* Aniyaanii: 8 August 1949, *St. John 23,721,* holotype; 25 August 1957, *Lane 57-121.* Japtan: 27 May 1946, *Taylor 46-1,292;* observed 1949, *St. John.* Eniwetok: observed 1949, *St. John.*

PALMAE

30. *Cocos nucifera* L. Unbranched tree, 4–30 m. × 30–70 cm., leaves in terminal plume; stipules 30–60 cm. long, oblong, in age the surface sheds leaving only the fiber mesh; petioles 1–3 m. long, massive; blades 3–6 m. long, pinnate; flowers monoecious, the staminate numerous, the pistillate 6–40; fruit husk mostly 20–40 cm. long, ellipsoid; shell bony, with three basal pores; endosperm white, edible. Once commonly cultivated.

Bogombogo: observed 1946, *Taylor.* Ruchi: observed 1946, *Taylor.* Elugelab: observed 1946, *Taylor.* Teiteiripucchi: observed 1946, *Taylor.* Bogon: observed 1949, *St. John.* Aitsu: observed 1949, *St. John.* Rujoru: observed 1946, *Taylor;* and 1949, *St. John.* Aomon: 14 August 1949, *St. John 23,829.* Biijiri: observed 1949, *St. John.* Aaraanbiru: observed 1946, *Taylor.* Runit: observed 1949, *St. John.* Japtan: observed 1949, *St. John.* Parry: observed 1946, *Taylor.* Eniwetok: observed 1946, *Taylor;* observed 1949, *St. John.* Igurin: 14 May 1946, *Fosberg 24,316;* observed 1946, *Taylor;* observed 1958, *St. John.* Mui: observed 1946, *Taylor.* Rigili: observed 1949, *St. John.*

LILIACEAE

31. *Allium Cepa* L. (?) Perennial herb, 20–60 cm. tall; bulb ovoid to spherical, white, pungent, with odor of onion; leaves 15–50 cm. long, hollow, tubular; scape exceeding the leaves, glaucous; inflorescence an umbel, the buds enclosed in a membranous bract; flowers white or bluish; fruit a small capsule.

As "onions" reported as observed on Eniwetok Islet, in American gardens, in 1944 by *Bryan.*

AMARYLLIDACEAE

32. *Crinum asiaticum* L. (?) Perennial herbs, dividing and forming clumps; from an underground bulb 10–13 cm. in diameter; leaves 20–30, and 0.5–1.5 m. long, 7–10 cm. wide, fleshy, strap-shaped; peduncle 0.5–1.3 m. long; flowers 20–50 in an umbel; pedicels 2.5 cm. long; perianth tube 8–10 cm. long, the segments alike, 6–8 cm. long, strap-shaped, white; capsule green, 2–3 cm. in diameter.

As "spider lily" reported as observed in American gardens on Eniwetok Islet in 1944, by *Bryan.*

TACCACEAE

33. *Tacca Leontopetaloides* (L.) Ktze. "Mokmok." Perennial from white, starchy, poisonous, buried tubers that resemble potatoes, tops annual; a single tuber bearing one leaf and one flower scape; petioles 0.3–1.3 m. tall; blades

0.3–0.7 m. long, 3-parted, then pinnately lobed into strap-shaped segments, horizontal; scape 1–2 m. tall, pale, hollow; flowers in a bracted umbel; perianth 15 mm. long, greenish; berry 20–25 mm. in diameter, globose, finally yellowish. The tubers were grated and washed by the natives to obtain the edible starch. The plant is scarce, probably due to dryness.

Engebi: observed 1949, *St. John.* Rujoru: 13 August 1949, *St. John 23,802;* 4 June 1946, *Taylor 46-1,342.* Biijiri: 14 August 1949, *St. John 23,819.* Japtan: 27 May 1946, *Taylor 46-1,287;* 15 May 1946, *Fosberg 24,333;* observed 1949, *St. John.* Parry: observed 1944, *Bryan.* Igurin: 9 August 1949, *St. John 23,735;* 6 September 1957, *Lane 57-128;* 9 August 1959, *St. John 26,315.*

DICOTYLEDONES

MORACEAE

34. *Artocarpus incisus* (Thunb.) L. f. "Me." Trees 7–25 m. × 0.3–1.5 m., widely branching, with milky sap; leaves alternate; petioles 3–8 cm. long; blades 30–70 cm. long, broadly elliptic, thick, firm, mostly deeply pinnately lobed; staminate flowers in fingerlike spikes 15–30 cm. long; pistillate flowers in stalked green round heads, producing the greenish aggregate fruits 15–30 cm. long, rounded, with or without seeds in the whitish, edible pulp. Of aboriginal cultivation.

Japtan: only 1 tree, 8 m. tall, 7 August 1949, *St. John 23,714;* this had vanished by August 1958, fide *St. John.*

URTICACEAE

35. *Fleurya ruderalis* (Forst. f.) Gaud."Nenkutkut." Roots fibrous; plant glabrous, 10–35 cm. tall; stems fleshy, often becoming reddish; petioles 5–40 mm. long; blades 10–55 mm. long, broadly deltoid ovate, coarsely crenate; peduncles axillary, shorter than the leaves; cymes broad, many flowered; sepals 1.5 mm. long; achenes 1–1.3 mm. long, broad ovoid, compressed, the sides rugose.

Aitsu: 10 March 1954, *Palumbo 1,110.* Engebi: 18 May 1946, *Fosberg 24,399.* Biijiri: 14 August 1949, *St. John 23,817.* Japtan: 15 May 1946, *Fosberg 24,321;* 27 May 1946, *Taylor 46-1,297;* 12 September 1957, *Lane 57-144.* Igurin: 9 August 1958, *St. John 26,313.* Rigili: 1 August 1956, *Rainey.*

OLACACEAE

36. *Ximenia americana* L. "Kalikelik." Shrub to 4 m. tall, sparsely thorny; herbage glabrous; petioles 3–7 mm. long; blades 13–63 mm. long, elliptic, entire; cymes 3–15-flowered, 1–2 cm. long, axillary; petals 6–10 mm. long; drupes 25–30 mm. long, ellipsoid, yellow, the flesh sour, edible.

Rujoru: 2 June 1946, *Taylor 46-1,331;* 13 August 1949, *St. John 23,801.* Japtan: 15 May 1946, *Fosberg 24,319.*

AMARANTHACEAE

37. *Achyranthes aspera* L. "Kaleklek." Short-lived herb, 40–100 cm. tall; stem simple or sparsely branched, appressed hirsute; leaves opposite; petioles 1–3 cm. long; blades 4–12 cm. long, broadly elliptic; spikes terminal 10–25 cm. long, dense; perianth of 3 bracts, the body 2.5 mm. long, the apical spine 2.5 mm. or more long; utricle 2.5 mm. long. Introduced weed.

Aomon: one patch near center, 16 May 1946, *Fosberg 24,348.*

38. *Achyranthes velutina* H. & A. *A. canescens* sensu Taylor Fl. Bikini; non R. Br. Plant herbaceous or at base somewhat woody, 1–3 m. tall, conspicuously hairy; petioles 4–15 mm. long; blades 8–12 cm. long, ovate to lanceolate, acute, cuneate, subappressed villous; spikes 10–25 cm. long, the axis densely white lanate; outer bracts 4–5 mm. long, the base ovate, scarious, the midrib a subulate projecting awn; sepals 5.5–6.5 mm. long, lanceolate; flowers ascending; fruits reflexed.

Giriniien; 20 August 1958, *Lane 57-108.*

39. *Amaranthus dubius* Mart. Herb 20–80 cm. tall, sparsely minutely puberulous, leaves alternate; petioles 3–65 mm. long; blades 3–12 cm. long, ovate, obtuse or acute; inflorescence a terminal panicle of spikes, plus numerous axillary spikes; sepals 1.5–2 mm. long, lanceolate, stiff acuminate; seeds 0.8–1 mm. in diameter, fat discoid, black, shining. Introduced weed.

Eniwetok: 6 August 1949, *St. John 23,702.*

40. *Amaranthus viridis* L. Short-lived herb, erect or prostrate; stem 30–80 cm. long, freely branching; leaves alternate; petioles 2.5–5 cm. long; blades 5–7.5 cm. long, lanceolate to ovate, smooth; flowers monoecious, in terminal spikes and often in axillary clusters; sepals nearly 1 mm. long, lanceolate; ovary wrinkled, and in fruit indehiscent; seeds less than 2 mm. wide, discoid, brown. Introduced weed.

Parry: 20 August 1944, *Bryan.*

NYCTAGINACEAE

41. *Boerhavia diffusa* L. var. *diffusa.* "Matok aitok." "Rebijraka." Trailing perennial herb, from fleshy root; branches 30–200 cm. long, often pink; leaves opposite; petioles 4–10 mm. long; blades 2.5–4 cm. long, ovate to ovate-lanceolate, variable; upright branchlets with reduced leaves; peduncles 2–8 cm. long; inflorescence umbellate-paniculate, with heads of pink flowers; calyx tube 3 mm. long, funnelform, glandular; stamens 2–3; nutlet 3 mm. long, fusiform, viscid hairy. Abundant.

Engebi: 18 May 1946, *Fosberg 24,394;* 12 August 1949, *St. John 23,779.* Aomon: 16 May 1946, *Fosberg 24,356,* and *24,362.* Aaraanbiru: 3 June 1946, *Taylor 46-1,337.* Aniyaanii: 8 August 1949, *St. John 23,718;* 1957, *Lane 57-120.* Japtan: 20 August 1944, *Bryan;* 27 May 1946, *Taylor 46-1,295.* Eniwetok: 6 August 1949, *St. John 23,709.* Igurin: 14 May 1946, *Fosberg 24,306;* 6 September 1957, Lane *37-123.* Rigili: 1 August 1956, *Rainey.*

42. *B. diffusa* var. *tetrandra* (Forst. f.) Heimerl. "Rabitchragai." Calyx tube glabrous; stamens 3–6.

Bogombogo: 31 May 1946, *Taylor 46-1,307.* Bogon: 11 August 1949, *St. John 23,761.* Rujoru: 13 August 1949, *St. John 23,806.* Aomon: 4 June 1946, *Taylor 46-1,350.* Aaraanbiru: 3 June 1946, *Taylor 46-1,335.* Runit: 24 May 1946, *Taylor 46-1,263.* Aniyaanii: 25 May 1946, *Taylor 46-1,274.* Igurin: 22 May 1946, *Taylor 46-1,250.* Rigili: 10 August 1949, *St. John 23,747;* 1 August 1956, *Rainey;* 11 September 1957, *Lane 57-131,* and *57-133.*

43. *Mirabilis Jalapa* L. "Emen aur." Herb 0.3–1 meter tall, glabrous, freely wide branching; leaves opposite; petioles 1–2.5 cm. long; blades 5–10 cm. long, ovate, the base truncate or cordate; involucre green; calyx 5–7 cm. long, wide funnelform, petaloid, in several colors; fruit leathery, ribbed; seeds 6 mm. in diameter, blackish. Introduced, probably as an ornamental.

Eniwetok: 17 May 1946, *Fosberg 24,370.*

44. *Pisonia grandis* R. Br. "Kangae." Tree, 5–20 m. tall; wood soft; leaves subopposite or crowded, nearly glabrous; petioles 1–4 cm. long; blades 8–20 cm. long, elliptic, the apex and base commonly acute; cymes terminal, more or less puberulent; flowers unisexual; calyx 4–6 mm. long, campanulate, pink; fruit 1 cm. long, fusiform, with several longitudinal, glandular spiny ribs. Abundant, forming forests on better habitats.

Elugelab: 2 June 1946, *Taylor 46-1,251.* Bogon: 11 August 1949, *St. John 23,769. Engebi:* 18 May 1946, *Fosberg 24,402.* Aitsu: 13 August 1949, *St. John 23,795.* Rujoru: 2 June 1946, *Taylor 46-1,325;* 13 August 1949, *St. John 23,807.* Aomon: 16 May 1946, *Fosberg 24,357;* 4 June 1946, *Taylor 46-1,352.* Biijiri: 14 August 1949, *St. John 23,816.* Aaranbiru: 3 June 1946, *Taylor 46-1,335.* Runit: 24 May 1946, *Taylor 46-1,265;* 15 August 1949, *St. John 23,839.* Aniyaanii: 25 May 1946, *Taylor 46-1,272;* 8 August 1949, *St. John 23,726.* Japtan: 15 May 1946, *Fosberg 24,332* and *24,337;* observed 1946, *Taylor;* 1957, *Lane 57-147.* Parry: observed 1944, *Bryan.* Jieroru: 21 May 1946, *Taylor 46-1,245.* Igurin: 14 May 1946, *Fosberg 24,304,* and *24,308;* 22 May 1946, *Taylor 46-1,251;* 9 August 1949, *St. John 23,736.* Giriinien: 20 August 1957, *Lane 57-107,* and *57-109.* Rigili: 10 August 1949, *St. John 23,744.*

PORTULACACEAE

45. *Portulaca lutea* Soland. "Kiran." Fleshy, long-lived herb, prostrate or suberect, glabrous; stems 15–50 cm. long, enlarging and becoming suffrutescent at base; petioles 1–3 mm. long, with tuft of axillary hairs; blades 10–35 mm. long; petals when fresh 10–12 mm. long, yellow; stamens 24–48; seeds 1–1.1 mm. long, black.

Bogombogo: 31 May 1945, *Taylor 1,312.* Bogon: 11 August 1949, *St. John 23,762.* Aitsu: observed 1949, *St. John.* Aomon: 16 May 1946,

Fosberg 24,358; 4 June 1946, *Taylor 46-1,344.* Aniyaanii: 8 August 1949, *St. John 23,728.* Japtan: 15 May 1946, *Fosberg 24,326.* Jieroru: 21 May 1946, *Taylor 46-1,242.* Igurin: 9 August 1949, *St. John 23,738.* Rigili: 10 August 1949, *St. John 23,749.*

46. *Portulaca oleracea* L. Fleshy herb, prostrate or ascending, glabrous, stems 5–40 cm. long; petioles 1–3 mm. long, with tufts of white axillary hairs; blades 12–25 mm. long, cuneate or cuneate-obovate; petals when fresh 2–4 mm. long; stamens 7–15; seeds 0.7 mm. long, black.

Engebi: 18 May 1946, *Fosberg 24,408;* 12 August 1949, *St. John 23,785* and *23,786.* Aitsu: observed 1949, *St. John.* Rujoru: observed 1949, *St. John.* Aomon: 14 August 1949, *St. John 23,834.* Runit: 15 August 1949, *St. John 23,850.* Eniwetok: 13 May 1946, *Fosberg 24,296;* observed 1949, *St. John.*

47. *Portulaca samoënsis* v. Poelln.; *P. quadrifida* sensu Kanehira, non L. "Bujon." Perennial, semiprostrate, fleshy herb, forming dense mats; stems 10–20 cm. long; leaves alternate, but at the stem apices much crowded; axillary hairs 4 mm. long, white, abundant; leaves 5–8 mm. long; petals yellow; capsule 3.5 mm. long, thin walled; seeds 0.5 mm. in diameter, reniform, black, rugose.

Aomon: 14 August 1949, *St. John 23,830.* Runit: 24 May 1946, *Taylor 1,258.* 15 August 1949, *St. John 23,851.* Aniyaanii: 8 August 1949, *St. John 23,719;* 25 August 1957, *Lane 57-115.*

LAURACEAE

48. *Cassytha filiformis* L. "Kenen." Parasitic, entwining herb; stems of great length, 1–3 mm. diameter, green, becoming yellowish; leaves reduced to tiny, alternate, ciliate scales; flower spikes 2.5–5 cm. long; calyx in 2 series, the 3 outer minute, the 3 inner 3 mm. long, white; drupe 6–7 mm. diam., globose, firm, cream-colored.

Elugelab: 2 June 1946, *Taylor 46-1,321.* Bogon: 11 August 1949, *St. John 23,770.* Engebi: observed 1949, *St. John.* Aitsu: observed 1949, *St. John.* Rujoru: 2 June 1946, *Taylor 1,330;* 13 August 1949, *St. John 23,803.* Aomon: 4 June 1946, *Taylor 46-1,347;* 16 May 1946, *Fosberg 23,803.* Runit: 24 May 1946, *Taylor 1,253;* 15 August 1949, *St. John 23,838.* Aniyaanii: 25 May 1946, *Taylor 46-1,277.* Japtan: 15 May 1946, *Fosberg 24,330.* Parry: observed 1944, *Bryan.* Eniwetok: 13 May 1946, *Fosberg 24,288;* observed 1949, *St. John.* Igurin: 14 May 1946, *Fosberg 24,313;* observed 1949, *St. John.* Giriinien: 23 August 1957, *Lane 57-110.* Rigili: 10 August 1949, *St. John 23,746.*

HERNANDIACEAE

48a. *Hernandia sonora* L. "Bingbing." Tree up to 15 m. tall, 20–40 cm. in diameter; leaves alternate, glabrous; petiole 10–13 cm. long; blades 12–20 cm. long, 8–16 cm. wide, broadly ovate, acute, peltate well in from the margin, palmately nerved; panicles 10–30 cm. long; flowers unisexual; flowers in 3's, 1 pistillate and 2 staminate in an involucre of 4 velvety bracts; staminate flowers with 3 sepals 5 mm. long, short hairy; 3 petals hairy; pistillate flowers each surrounded by a cuplike involucre; three sepals 4 mm. long; petals 3, closely hairy; ovary 1-celled, inferior; fruit an achene 25 mm. long, ellipsoid, brown, loosely enclosed by the greenish, fleshy involucre with its apical circular aperture.

Eniwetok: 1958, *Palumbo.* Fruits found in jetsam on sea beaches, not known growing on the island. However, it is indigenous and common on other Marshall islands, the nearest localities being on Ujelang, Kwajalein, Wotje, and Likiep. The specimens were determined by F. R. Fosberg.

CRUCIFERAE

49. *Brassica oleracea* L. *capitata.* Annual or biennial herb, in the first year forming a dense, headlike rosette; leaves sessile 15–35 cm. long, suborbicular, fleshy, with a sharp taste; later producing an upright leafy stem; racemes loose; petals yellow; capsule 5–10 cm. long, with a conical beak. Cultivated vegetable.

Eniwetok: observed 1944, as "cabbage" in American gardens, *Bryan.*

50. *Brassica pekinensis* (Lour.) Rupr. Annual herb forming close rosette, nearly glabrous; basal leaves 30–60 cm. long, oblong-obovate, thin, undulate, mild in taste; petiole flat, auriculate-winged; flowers crowded at tip of raceme; petals 1 cm. long, light yellow; capsule

3–6 cm. long, stout. Cultivated vegetable.

Engebi: in old garden, May 1944, *Fosberg.*

51. *Brassica* sp. (?)

Engebi: "two hardy, although somewhat wilted members of the cabbage family," observed 1944, *Bryan.*

52. *Raphanus sativus* L. Annual or biennial; root enlarged, peppery, edible; stem 60–100 cm. tall, glaucous; leaves lyrate; racemes loose; petals 15 mm. long, white to purplish; capsule 2.5–7.5 cm. long, beaked. Cultivated vegetable.

Eniwetok: in American gardens, observed as "radish" in 1944, *Bryan.*

LEGUMINOSAE

52a. *Caesalpinia Bonduc* (L.) Roxb. Large, sturdy vine, often 10 m. long; stems thorny; stipules none; leaves bipinnate, the leaflets in 4–8 pairs on each pinna, 3–5 cm. long, broadly elliptic, the petioles and rhachises prickly; sepals 7–8 mm. long, oval; petals yellow, 2–3 times as long as the sepals; pods about 7 cm. long, oval, compressed, prickly; the 2–3 seeds 14 mm. in diameter, globose, gray.

Eniwetok Atoll: 1946, *St. John 22,197*; 1958, *Palumbo.* Found only as drift seeds on the beaches. They could have come from the northeast, the south, or the west.

53. *Canavalia microcarpa* (DC.) Piper; *C. turgida* Graham ex Miq. "Marlap." Biennial, herbaceous vine; stems glabrous; leaves trifoliolate; petiole 6–15 cm. long; leaflets 6–10 cm. long, oval, acuminate, abruptly obtuse at base, almost glabrous; peduncle 15–25 cm. long; pedicels 2 mm. long; calyx 12 mm. long, sparsely villous; petals 20–25 mm. long, rose-colored; pod 9–12 × 3.5 cm.; seeds 18 × 12 mm., compressed, brown.

Eniwetok: 6 August 1949, *St. John 23,707.* Igurin: 14 May 1946, *Fosberg 24,309*; 9 August 1949, *St. John 23,739,* and *26,316.*

53a. *Dioclea reflexa* Hook. f. Woody vine; petioles 7.2–9.6 cm. long, pilose; leaflets 3, terminal leaflet 13.2–16 cm. long, broad elliptic, subacuminate, firm, below sparsely villous on veins; peduncle 10–33 cm. long; floral bracts prominent, 9–12 mm. long; calyx 12–14 mm. long, cupulate, hirsutulous; corolla reddish purple, the banner 17–21 mm. long, suborbicular; pod 11–14.5 × 5.8–6.6 cm. × 9 mm., oval; seeds 27–29 × 21–26 × 12–17.5 mm., reddish to brownish.

Found rarely as seeds only, in the drift on the beaches. Collected in 1946, *St. John 22,007;* and about 1953 by *Donaldson.* It probably came from the west or south.

54. *Entada phaseoloides* (L.) Merr. Woody vine of great size, stems up to 75 m. in length, somewhat flattened and up to 15 cm. in width, containing potable water; leaves bipinnate; stipules 4 mm. long, hornlike, caducous; petioles 10–25 cm. long, ending in a 2-parted tendril; leaflets 4–6 cm. long, 2–3 cm. wide, oblong or lanceolate; flowers subsessile in spikes; petals 2.5 mm. long, narrowly oblong; pod 45–60 cm. long, 5–7 cm. wide, massive, contracted around the seeds; seeds discoid, shining, brown, hard.

Eniwetok: 1958, *Palumbo* no. *D.* Known here only as seeds in the sea drift. Not indigenous to the Marshalls, but probably drifting from islands to the south or west.

55. *Mucuna urens* (L.) Medic. Climbing vine; leaves alternate, 3-foliolate; petioles 6–12 cm. long; terminal leaflet 7.5–16 cm. long, lanceovate to obovate, acuminate; inflorescence 30–90 cm. long, many flowered; calyx 11–13 mm. long, campanulate, sericeous and hispid; corolla 35 mm. long; pods 15–25 cm. long, oblong, 4–4.5 cm. wide, densely hispid with irritating hairs; seeds 3 cm. broad, discoid, flattened but fat, brown, surrounded by the hilum.

An exotic, not found growing, but as drift seeds on beach of Engebi, 1949, *St. John.* It surely drifted from Hawaii on the northeast.

56. *Phaseolus vulgaris* L. Annual vines, erect or twining, pubescent; the three leaflets 10–15 cm. long, rhombic-ovate, acuminate; racemes few-flowered; petals 12–22 mm. long, white to purple; pod 10–20 cm. long, terete or compressed, edible. Cultivated vegetable.

Eniwetok: in American gardens, as "string beans," observed 1944, *Bryan.*

57. *Phaseolus* sp. (?)

Eniwetok: in American gardens, as "beans," observed 1944, *Bryan.*

58. *Vigna marina* (Burm.) Merr. "Markinejojo." Trailing perennial vine; stems 15–100 cm. long; the three leaflets 5–8 cm. long, obovate to suborbicular, somewhat fleshy, sparsely

appressed pilose when young; flowers in racemes; corolla 10–14 mm. long, bright yellow; legume 5–7 cm. long, the valves twisting after opening. Seeds 6–8 mm. long.

Parry: observed 1944, *Bryan.*

ZYGOPHYLLACEAE

59. *Tribulus cistoides* L. Erect perennial herb, forming clumps, hirsute; stipules 4–7 mm. long; leaves opposite, even pinnate with 8 pairs of leaflets, these 12–16 mm. long, oblong-elliptic, white appressed sericeous; flowers solitary; sepals 6 mm. long; petals 2–2.5 cm. long, obovate, bright yellow; fruit splitting into 5-6 wedge shaped cocci, each with 2 strong dorsal horns.

Engebi: 15 May 1946, *Fosberg 24,403.*

SIMAROUBACEAE

60. *Suriana maritima* L. "Ngiungi." Shrub 1-3 m. tall; leaves 1–2 cm. long, linear spatulate, alternate but crowded, closely appressed pilose; racemes subterminal; calyx lobes lance-deltoid; petals 7–9 mm. long, yellow, the 5 carpels free; capsules 1-seeded.

Bogombogo: 31 May 1946, *Taylor 46-1,306.* Bogon: 11 August 1949, *St. John 23,765.* Rujoru: 2 June 1946, *Taylor 46-1,324;* 13 August 1949, *St. John 23,809.* Aomon: 4 June 1946, *Taylor 46-1,343;* observed 1949, *St. John.* Igurin: 14 May 1946, *Fosberg 24,310;* 9 August 1949, *St. John 23,734.* Giriinien: 28 May 1946, *Taylor 46-1,303;* 23 August 1957, *Lane 57-112.* Rigili: 10 August 1949, *St. John 23,752.*

EUPHORBIACEAE

60a. *Aleurites moluccana* L. Tree 12–25 m. tall, 25–100 cm. in diameter; bark gray; sap a blood coagulant; leaves alternate, the young ones concealed by appressed pubescence and from a distance appearing white; petioles 4–15 cm. long, stellate pubescent or farinose; blades strikingly polymorphic, narrow or broad, entire or lobed, with a lateral lobe on each side, or only on the right side, or only on the left side, 8–20 cm. long, 4–10 cm. wide, stellate pubescent to subglabrate; panicles 10–15 cm. long, pubescent; flowers unisexual, the pistillate few; staminate flowers with calyx 3–4 mm. long, ovoid, 2–3-lobed; petals 5–9 mm. long, oblong, white; stamens 12 or more; pistillate flowers with calyx 6 mm. long; nut mostly 1-seeded and globose, the husk 5 cm. in diameter, green, then wrinkled and brownish, separating after decaying; stone 2.5–3 cm. long, subovoid, resembling an English Walnut; seed oily, cathartic, but after roasting edible and tasty.

Eniwetok: 1958, *Palumbo.* Found only as a single husked stone in the sea drift. It arrived by flotation, but could have come from the northeast, as Hawaii, or from the south, or from the west.

61. *Euphorbia Chamissonis* (Klotsch & Garcke) Boiss. "Berol." Glabrous perennial herb, forming clumps 20–30 cm. tall; leaves 2 cm. long, entire, obovate, obtuse or retuse, subcordate, glaucous below; cymes terminal; involucre turbinate, the ovate-triangular teeth hirsute, the glands white, entire or lobed; seeds ovate-quadrangular, subrugose tuberculate.

Bogon: 11 August 1949, *St. John 23,767.* Engebi: 18 May 1946, *Fosberg 24,385.* Eniwetok: 10 September 1957, *Lane 57-129.*

62. *Euphorbia hirta* L. Short-lived herb, often branching near the base, the tips ascending, 15–30 cm. tall, densely hirsute; petioles 2 mm. long; blades 2–4 cm. long, elliptic-oblong to oblong-lanceolate, serrate; inflorescences axillary, capitate, greenish to purplish; involucre 1 mm. long, puberulent; capsule long stalked, 1.5 mm. diam.; seeds 0.5 mm. long, oblong, brown. Introduced weed.

Japtan: 12 September 1957, *Lane 57-146.* Eniwetok: 17 May 1946, *Fosberg 24,367.*

63. *Euphorbia thymifolia* L. Short-lived herb, stems 10–30 cm. long, prostrate, densely hirsute; leaves opposite; petioles 2 mm. long; blades 2–4 cm. long, ovate-elliptic, oblique, acute, serrulate; flowers in dense axillary cymes; involucres 1 mm. long; capsule 1.5 mm. diam., puberulent; seeds reddish brown, rugulose. Introduced weed.

Japtan: 12 September 1957, *Lane 57-143.* Eniwetok: 10 September 1957, *Lane 57-130.*

64. *Phyllanthus amarus* Schum. & Thonn. *P. niruri* auth. in part, not of L. Erect, short-lived herb, 1–5 dm. tall; internodes 1–3 cm. long; stipules 0.8–1.3 mm. long, broadly ovate-lanceolate or lanceolate; petioles 0.3–0.5 mm. long; blades mostly 5–11 mm. long, elliptic-oblong, obtuse or apiculate; staminate flowers with

calyx lobes 0.3–0.6 mm. long; pistillate flowers on pedicels 0.6–0.7 mm. long, becoming 1–2 mm. long; the calyx lobes 0.9–1.1 mm. long, whitish scarious margined; capsule 1.9–2.1 mm. diam., oblate, trigonous; seeds 0.9–1 mm. long, trigonous, light brown, 5–6-ribbed on the back. Weed, introduced from America.

Japtan: observed 1949, *St. John.* Parry: 20 August 1957, *Lane 57-105.* Eniwetok: 6 August 1949, *St. John 23,706.*

65. *Ricinus communis* L. Shrub or tree up to 9 m. tall; leaves alternate; flowers monoecious in terminal racemes; staminate flowers with 3–5-parted calyx, and numerous stamens with branched filaments; pistillate flowers higher up with deciduous calyx; capsule rounded, 3-lobed, spiny; seeds 7–15 mm. long, ellipsoid, mottled. Introduced ornamental.

Engebi: 18 May 1946, *Fosberg 24,377.* Eniwetok: 6 August 1949, *St. John 23,701.*

SAPINDACEAE

65a. *Sapindus Saponaria* L. Tree 5–10 m. tall; bark gray, rough; leaves alternate, without stipules, odd pinnate, 20–50 cm. long; petiole and rhachis commonly winged; leaflets mostly 7–9 and 5–15 cm. long, elliptic to oblong-lanceolate, obtuse or acute, often falcate; panicles 17–27 cm. long, pubescent; sepals 1.5 mm. long, pubescent; petals 2.5 mm. long, elliptic, white, ciliate; berry nearly 2 cm. in diameter, brown, the flesh translucent, orange brown; seed bony, black.

Eniwetok Atoll: 1958, *Palumbo.* Found rarely as seeds in drift on sea beaches, not indigenous in Marshall Is. Probably the seeds drifted from Hawaii, that is from the northeast. Specimens determined by F. R. Fosberg.

TILIACEAE

66. *Triumfetta procumbens* Forst. f. "Adat." Perennial, trailing suffrutescent vine, generally stellate hirsutulous; petioles 2–4 cm. long; blades 3–10 cm. long, suborbicular but the base rounded or cordate, the apex with 3 large, rounded lobes, the texture firm, above green and smooth; cymes axillary; 5 sepals 1 cm. long, linear-oblong; petals 1 cm. long, yellow; capsules 12 mm. in diameter. The stem has a band of excellent white fiber, much used in weaving.

Bogombogo: 31 May 1946, *Taylor 46-1,313.* Bogon: 31 May 1946, *Taylor 46-1,316;* 11 August 1949, *St. John 23,768.* Engebi: observed 1944, *Bryan;* 18 May 1946, *Fosberg 24,401;* observed 1949, *St. John.* Aitsu: 13 August 1949, *St. John 23,792.* Rujoru: 13 August 1949, *St. John 23,804.* Aomon: 16 May 1946, *Fosberg 24,366;* 4 June 1946, *Taylor 46-1,351;* observed 1949, *St. John.* Biijiri: 14 August 1949, *St. John 23,818;* Runit: 24 May 1946, *Taylor 46-1266B;* 15 August 1949, *St. John 23,848.* Aniyaanii: 25 May 1946, *Taylor 46-1,275;* 25 August 1957, *Lane 57-118.* Japtan: 15 May 1946, *Fosberg 24,322.* Parry: observed 1944 *Bryan.* Jieroru: 21 May 1946, *Taylor 46-1,248.* Eniwetok: 13 May 1946, *Fosberg 24,299;* observed 1949, *St. John.* Igurin: 14 May 1946, *Fosberg 24,311;* observed 1949, *St. John.* Mui: 9 August 1958, *St. John 26,318.* Rigili: 10 August 1949, *St. John 23,754;* 1 August 1956, *Rainey.*

MALVACEAE

67. *Malvastrum coromandelianum* (L.) Garcke. Long-lived herb, 0.3–1 m. tall, sparsely hirsute; petioles 6–18 mm. long; blades 2.5–5 cm. long, lanceolate to ovate, sparsely appressed hirsute, the margin serrate; flowers axillary; pedicels 4–6 mm. long; calyx 3-bracted, 6–9 mm. long; petals orange-yellow, a little longer; carpels borne in a ring, each 3-spined; seed 2 mm. wide, cordate brown. Introduced weed.

Parry: 16 August 1957, *Lane 57-103.*

68. *Sida fallax* Walp. "Kio." Shrub 0.3–1.5 m. tall, with many lateral, slightly ascending branches; stipules subulate; petioles 7–12 mm. long; blades 2.5–3.3 cm. long, ovate to elliptic, crenate, hoary on both sides; calyx 6 mm. long, closely stellate hoary, funnelform, lobed half way, the tube 10-ribbed; petals 10–12 mm. long, orange-yellow; fruit separating into several cocci 3–3.6 mm. long, wedge-shaped, the back rugose, the apex opening by 2 rounded oblique valves.

Eleugelab: 2 June 1946, *Taylor 46-1,318.* Engebi: 21 August 1944, *Bryan;* May 1946, *Fosberg & Hosaka 24,389;* 18 May 1946, *Fosberg 24,393;* observed 1949, *St. John.* Aitsu: 13 August 1949, *St. John 23,794.* Rujoru: 2 June 1946, *Taylor 46-1,329;* 13 August 1949, *St. John*

23,808. Aomon: 16 May 1946, *Fosberg 24,359;* 4 June 1946, *Taylor 46-1,348;* 14 August 1949, *St. John 23,832,* and *23,833.* Parry: 20 August 1944, *Bryan.* Eniwetok: 17 May 1946, *Fosberg 24,371;* observed 1949, *St. John.* Igurin: 9 August 1958, *St. John 26,314.* Rigili: 1946, *Morrison (Taylor 46-1,281);* 10 August 1949, *St. John 23,750;* 1 August 1956, *Rainey;* 11 September 1957, *Lane 57-134.*

CARICACEAE

69. *Carica Papaya* L. "Keinapu." Columnar trees 3–15 m. tall, with soft trunk and milky sap; leaves in terminal wide spreading plume; petioles 20–70 cm. long, hollow; blades 40–110 cm. long, circular in outline, deeply 7-lobed then pinnatifid; flowers usually dioecious; staminate flowers borne in pendent racemes, numerous, white, 2.5 cm. long, the tube slender, elongate; pistillate flowers axillary, subsessile, 2.5 cm. long, creamy white, with 5 distinct petals; fruit 8–40 cm. long, ellipsoid to globose, the pulp edible; seeds 2 mm. long, black. Recently introduced fruit tree.

Parry: observed 1958, *St. John.*

LYTHRACEAE

70. *Pemphis acidula* J. R. & G. Forst. "Kungi." Shrub or rarely tree up to 11 m. tall; the wood hard and tough; leaves opposite, subsessile, 10–32 mm. long, lanceolate to oval, obtuse or acute, appressed sericeous; flowers single in axils; calyx 6-lobed, hairy; petals 4–6 mm. long, obovate; seeds 3 mm. long, cuneate.

Bogon: 11 August 1949, *St. John 23,774.* Aniyaanii: 25 May 1946, *Taylor 46-1,276;* 8 August 1949, *St. John 23,727;* Giriinien: 1957, *Lane 57-106.*

RHIZOPHORACEAE

71. *Rhizophora Mangle* L. Tree to 25 m. tall, glabrous; petioles 10–25 mm. long; blades 5–15 cm. long, elliptic, leathery, blunt or notched; cymes 3–4 cm. long; calyx and corolla 1 cm. long; 4 petals lanceolate, yellow, pilose within; capsule 2.5 cm. long. Introduced tree, restricted to tidal salty shores.

Bogombogo: February 1954, planted by *Palumbo.*

COMBRETACEAE

72. *Terminalia samoensis* Rechinger. "Kugung." *T. litoralis* sensu Taylor, Fl. Bikini, non Seem. Tree up to 8 m. × 30 cm.; stems and petioles tawny appressed puberulent; leaves alternate; petioles 1–3 cm. long; blades 6–15 cm. long, broadly obovate, obtuse or subacute; inflorescences 3–10 cm. long, axillary, puberulent; flower 7 mm. long, urceolate, the tube hirsutulous without; drupes 15–18 mm. long, ellipsoid, compressed, red.

Elugelab: 2 June 1946, *Taylor 46-1,317.* Aitsu: 13 August 1949, *St. John 23,797.* Rujoru: 2 June 1946, *Taylor 46-1,323.* Aomon: 4 June 1946, *Taylor 46-1,341.* Aniyaanii: 25 May 1946, *Taylor 46-1,273;* 13 September 1957, *Lane 57-148.* Japtan: 15 May 1946, *Fosberg 24,331;* 27 May 1946, *Taylor 46-1,285.* Jieroru: 21 May 1946, *Taylor 46-1,243.* Mui: 28 May 1946, *Taylor 46-1,301.* Giriinien: 23 August 1957, *Lane 57-111.* Rigili: 10 August 1949, *St. John 23,741;* 1 August 1956, *Rainey.*

APOCYNACEAE

73. *Ochrosia oppositifolia* (Lam.) K. Schum. "Kijebar." Tree up to 15 m. × 90 cm.; leaves glabrous; petioles 3–5 cm. long; blades 10–35 cm. long, elliptic to obovate-elliptic, firm; cymes 7–10 cm. long; calyx 4–5 mm. long; corolla white, the tube 6 mm. long, the 5 lobes 7–8 mm. long, obtuse; fruits 6 cm. long, twinned, ellipsoid, red, 2-seeded; mesocarp with many longitudinal fibers. Tissues poisonous.

Japtan: 15 May 1946, *Fosberg 24,329;* 27 May 1946, *Taylor 46-1,291;* observed 1949, *St. John.* Igurin: 6 September 1957, *Lane 57-124.*

CONVOLVULACEAE

74. *Ipomoea pes-caprae* (L.) Sweet, subsp. *brasiliensis* (L.) v. Ooststr. "Marginejojo." Perennial, glabrous vine; branches trailing, up to 10 m. long; petioles 5–20 cm. long; blades 3–12.5 cm. long, thick, ovate to obovate to suborbicular, commonly emarginate, rarely obtuse or acute and mucronulate; cymes 3–10 cm. long, 1–20-flowered; sepals unequal, the outer 5–13 mm. long, the inner 7–16 mm. long; corolla 3–7 cm. long, short broad funnelform; capsules 13–19 mm. in diameter; seeds 7–9 mm.

long, spherical, brown villous.

Engebi: 18 May 1946, *Fosberg 24,404;* 12 August 1949, *St. John 23,778.* Aomon: 14 August 1949, *St. John 23,831.* Eniwetok: 13 May 1946, *Fosberg 24,287;* observed 1949, *St. John.* Igurin: 9 August 1949, *St. John 23,733.*

75. *Ipomoea purpurea* (L.) Roth. Short-lived, twining climber; stems 1–3.3 m. long, retrorse pilose; petioles 7–13 cm. long; blades 7–13 cm. long, acute; peduncles 1–5-flowered, sepals 12–16 mm. long, lanceolate, hirsute at base; corolla 4.5–7 cm. long, narrow funnelform; capsule 1 cm. diameter. Cultivated ornamental.

Engebi: observed May 1949, *Townes.*

76. *Ipomoea tuba* (Schlecht.) G. Don. "Marbele." *I. alba.* sensu Taylor, Fl. Bikini. Perennial glabrous vine, trailing or climbing; stems to 8 m. long; petioles 4–8 cm. long; blades 7–15 cm. long, broadly ovate, deeply cordate, soft and a little fleshy; peduncles 2–10 cm. long, usually 1-flowered; sepals elliptic, 2 cm. long, subequal; corolla 5–8 cm. long, trumpet-shaped; capsule 15 mm. long, subglobose; seeds villous on angles and by hilum, puberulent elsewhere.

Engebi: 12 August 1949, *St. John 23,781.* Aitsu and Rujoru: observed 1949, *St. John.* Aomon: 4 June 1946, *Taylor 46-1,346;* observed 1949, *St. John.* Biijiri: 14 August 1949, *St. John 23,825.* Runit: observed 1949, *St. John.* Aniyaanii: 8 August 1949, *St. John 23,720;* 25 August 1957, *Lane 57-119.* Japtan: 27 May 1946, *Taylor 46-1,290;* observed 1949, *St. John.* Jieroru: 25 May 1946, *Taylor 46-1,239.* Eniwetok and Igurin: observed 1949, *St. John.*

BORAGINACEAE

77. *Cordia subcordata* Lam. "Kono." Tree, 7–16 m. tall; wood brown, hard; petioles 2–6 cm. long; blades 12–15 cm. long, ovate to subcordate, firm, nearly glabrous except for hairy tufts in vein axils below; cymes shorter than petioles; calyx 10–15 mm. long, urceolate, irregularly 3–5-lobed; corolla broad funnelform; drupe 10–30 mm. long, bony.

Aitsu: 13 August 1949, *St. John 23,796.* Aomon: 16 May 1946, *Fosberg 24,351;* 4 June 1946, *Taylor 46-1,346.* Aaraanbiru: 3 June 1946, *Taylor 46-1,338.* Runit: 24 May 1946, *Taylor 46-1,267.* Aniyaanii: 25 May 1946, *Taylor 46-1,270;* 8 August 1949, *St. John 23,725;* and 23 August 1957, *Lane 57-112,* and *57-148.* Japtan: observed 1944, *Bryan;* 15 May 1946, *Fosberg 24,338;* 27 May 1946, *Taylor 46-1,290.* Jieroru: 25 May 1946, *Taylor 46-1,239.* Igurin: 14 May 1946, *Fosberg 24,303;* 9 August 1949, *St. John 23,737.* Rigili: 10 August 1949, *St. John 23,742.*

78. *Messerschmidia argentea* (L. f.) Johnst. "Kirin." Tree to 10 m. × 45 cm.; herbage appressed sericeous; leaves in terminal plumes; petioles 5–10 cm. long; blades 8–20 cm. long, oblanceolate, thick, fleshy; cymes 10–25 cm. long, terminal, many-flowered; berries 3–7 mm. diameter, white. Here often shrublike.

Bogombogo: 31 May 1946, *Taylor 46-1,309.* Ruchi: observed 1949, *Taylor.* Elugelab: observed 1949, *Taylor.* Bogon: 11 August 1949, *St. John 23,763.* Engebi: 18 May 1946, *Fosberg 24,396;* observed 1949, *St. John.* Aitsu: 13 August 1949, *St. John 23,791.* Rujoru: 2 June 1946, *Taylor 46-1,326;* 13 August 1949, *St. John 23,805.* Aomon: 14 May 1946, *Fosberg 24,352;* observed 1949, *St. John.* Biijiri: 14 August 1949, *St. John 23,821.* Runit: 24 May 1946, *Taylor 46-1,264;* 15 August 1949, *St. John 23,852.* Aniyaanii: 25 May 1946, *Taylor 46-1,279;* 8 August 1949, *St. John 23,724.* Chinimi: observed 1946, *Taylor.* Japtan: 15 May 1946, *Fosberg 24,339;* observed 1949, *St. John.* Parry: observed 1944, *Bryan;* and 1958, *St. John.* Jieroru: 21 May 1946, *Taylor 46-1,246.* Eniwetok: observed 1944, *Bryan;* 13 May 1946, *Fosberg 24,293;* observed 1949, *St. John.* Igurin: 14 May 1946, *Fosberg 24,315;* observed 1946, *Taylor,* and 1949, *St. John.* Mui: 9 August 1958, *St. John 26,319.* Rigili: 10 August 1949, *St. John 23,748.*

SOLANACEAE

79. *Nicotiana glauca* Graham. Shrub 2–4 m. tall, glabrous; branches erect, wandlike; petioles 2–8 cm. long; blades 3–16 cm. long, ovate, acute, often cordate, pale, glaucous; flowers in terminal panicles with subulate bracts; calyx 10–12 mm. long, ovoid, faintly angled, 5-toothed; corolla 27–37 mm. long, yellow, tubular, puberulent, the lobes 1–2 mm. long, low deltoid; capsules 9–10 mm. long, ovoid; seeds 0.5 mm. long, brown. Introduced weed.

Engebi: 4 April 1954, *Palumbo 1,124.*

80. *Physalis angulata* L. var. *angulata.* Short-lived herb, 15–90 cm. tall; puberulous especially on younger parts (or glabrous); petioles 1–4 cm. long; blades 4–10 cm. long, ovate to ovate-lanceolate, subentire or more or less salient toothed; pedicels in flower 5–15 mm. long, in fruit 20–30 mm. long; calyx in flower 4–5 mm. long, in fruit 25–35 mm. long, inflated, greenish; corolla 4–10 mm. long, yellowish; anthers 1–2.3 mm. long; seeds 1.6–1.8 mm. long, reniform, flat, reticulate, yellowish. Weed introduced from North America.

Japtan: 12 September 1957, *Lane 57-139.* Parry: 16 August 1957, *Lane 57-101.*

81. *Solanum Lycopersicum* L. Short-lived herb, viscid hirsute 0.3–1.6 m. tall; leaves 15–45 cm. long; petioles 20–45 mm. long; odd-pinnate, the large leaflets 5–10 cm. long, ovate or ovate-lanceolate, mostly alternating with tiny secondary leaflets; racemes 3–7-flowered; calyx 10–15 mm. long, the lobes lance-linear; corolla 7–12 mm. long, blue, the lobes lanceolate; berry 0.7–10 cm. long, subglobose, red or yellow, edible. The tomato, cultivated for its edible fruit.

Engebi: May 1944, *Fosberg.* Eniwetok: observed 1944, *Bryan.*

RUBIACEAE

82. *Guettarda speciosa* L. "Wut." Tree up to 8 m. × 15 cm.; young twigs puberulent; leaves opposite; stipules 10–14 mm. long; petioles 1–3.5 cm. long, glabrate; blades 10–23 cm. long, broadly obovate to suborbicular, below sparsely hirtellous, the base rounded or cordate; cymes 6–17 cm. long, axillary; calyx campanulate; corolla appressed puberulent, white, fragrant, the tube 35–40 mm. long, the 4–9 lobes oval; drupes 2.5–3 cm. diameter, white.

Bogombogo: 31 May 1946, *Taylor 46-3,110.* Elugelab: observed 1946, *Taylor.* Bogon: 11 August 1949, *St. John 23,773.* Engebi: 21 August 1944, *Bryan;* 18 May 1946, *Fosberg 24,398;* observed 1949, *St. John.* Aitsu: 13 August 1949, *St. John 23,793.* Rujoru: 2 June 1946, *Taylor 46-1,328;* observed 1949, *St. John.* Aomon: 16 May 1946, *Fosberg 24,364;* 4 June 1946, *Taylor 46-1,349.* Biijiri: 14 August 1949, *St. John 23,815.* Runit: 24 May 1946, *Taylor 46-1,254;* 15 August 1949, *St. John 23,843.* Aniyaanii: 25 May 1946, *Taylor 46-1,278.* Japtan: 15 May 1946, *Fosberg 24,318;* observed 1946, *Taylor,* and 1949, *St. John.* Parry: observed 1944, *Bryan;* 6 August 1958, *St. John 26,304.* Jieroru: 2 May 1946, *Taylor 46-1,244.* Eniwetok: 13 May 1946, *Fosberg 24,294;* observed 1949, *St. John.* Igurin: 14 May 1946, *Fosberg 24,312;* observed 1949, *St. John.* Rigili: 10 August 1949, *St. John 23,745;* 1 August 1956, *Rainey.*

83. *Morinda citrifolia* L. "Nen." Shrub or slender tree up to 8 m. tall, glabrous; leaves opposite; stipules 2–3 cm. long, rounded; petioles 1–4 cm. long; blades 10–35 cm. long, elliptic or ovate; flowers in axillary heads about 2.5 cm. long; calyx entire; corollas white, the tube 10 mm. long, the 4 lobes 5 mm. long, elliptic; syncarp 5–10 cm. long, ellipsoid, honey-colored, bitter, medicinal.

Engebi: observed 1944, *Bryan;* 18 May 1946, *Fosberg 24,381;* 12 August 1949, *St. John 23,780.* Aomon: 16 May 1946, *Fosberg 24,350.* Biijiri: 14 August 1949, *St. John 23,822.* Aniyaanii: 8 August 1949, *St. John 23,723;* 25 August 1957, *Lane 57-117.* Japtan: 15 May 1946, *Fosberg 24,335;* observed 1946, *Taylor,* and 1949, *St. John.* Eniwetok: 6 August 1949, *St. John 23,705.* Igurin: 14 May 1946, *Fosberg 24,302;* observed 1949, *St. John.*

CUCURBITACEAE

84. *Citrullus vulgaris* Schrad. Short-lived, trailing vine, hirsute; stems 1–6 m. long; petioles 2.5–10 cm. long; blades 7–20 cm. long, bi-tripinnatifid; peduncles axillary, shorter than the leaves; calyx 8–10 mm. long; corolla 18–22 mm. long, rotate, deeply 5-parted, the lobes obovate; fruit 20–60 cm. long, globose to ellipsoid; pulp red, edible; seeds 15 mm. long, obovate, black. The introduced watermelon.

Engebi: old garden, May 1946, *Fosberg.* Eniwetok: American gardens, observed 1944, *Bryan.*

85. *Cucumis Melo* L. Trailing, hirsute vine; stems 1–3 m. long; petioles 3–6 cm. long; blades 4–13 cm. long, orbicular-ovate to reniform, mostly 5-angled, sinuate dentate; calyx lobes 3–4 mm. long, linear; corolla 15–17 mm. long; fruit 10–30 cm. long, globose to ellipsoid, pulp edible; seeds 4–6 mm. long, pale. The introduced cantaloupe.

Engebi: in old gardens, May 1946, *Fosberg.*

86. *Cucurbita maxima* Duch. Short-lived, trailing vine, hispid; stems 2–10 m. long; petioles 20–40 cm. long, blades 25–40 cm. long, suborbicular, shallowly serrate, deeply cordate; flowers single; pedicels 10–30 cm. long, not swollen at apex in fruit; calyx lobes 3–10 mm. long, linear; corolla 6–8 cm. long; fruit 10–50 cm. long, variable in shape and color. The cultivated squash.

Engebi: May 1946, *Fosberg 24,376* and *24,380.* Eniwetok: American gardens, observed 1944, *Bryan.*

87. ? *Lagenaria siceraria* (Molina) Standl. Bottle Gourd. ? Engebi: there is a report by MacMillan and Smith, 1946, of observing a cultivated plant "probably *Lagenaria.*" This is deemed doubtful and not to be accepted unless confirmed by other records.

GOODENIACEAE

88. *Scaevola frutescens* (Mill.) Krause var. *frutescens.* "Mar kinat." Shrub, 1–6 m. tall, branching and forming thickets; leaves alternate, without stipules, in terminal plumes, the cuneate leaf base merging into an indefinite petiole; blades 7–25 cm. long, cuneate-obovate or oblance-elliptic, thick, usually concave below, glabrous or almost so; cymes 2.5–8 cm. long, 5–9-flowered; calyx lobes 1.5–3 mm. long, lanceolate; corolla 12–16 mm. long, white except for the magenta nerves in the lobes; berries 10–12 mm. in diameter, globose, pithy, white. The most abundant shrub, especially near the shore.

Bogombogo: 31 May 1946, *Taylor 46-1,308.* Elugelab: 2 June 1946, *Taylor 46-1,322.* Bogon: 11 August 1949, *St. John 23,764.* Engebi: observed 1944, *Bryan;* 11 May 1946, *Fosberg 24,397;* observed 1949, *St. John.* Aitsu: 13 August 1949, *St. John 23,790.* Rujoru: 2 June 1946, *Taylor 46-1,327;* observed 1949, *St. John.* Aomon: 16 May 1946, *Fosberg 24,361;* observed 1949, *St. John.* Runit: 24 May 1946, *Taylor 46-1,266A.* Aniyaanii: 25 May 1946, *Taylor 46-1,271;* 8 August 1949, *St. John 23,722.* Japtan: 15 May 1946, *Fosberg 24,336;* observed 1946, *Taylor,* and 1949, *St. John.* Chinimi: observed 1946, *Taylor.* Parry: observed 1944, *Bryan.* Jieroru: 21 May 1946, *Taylor 46-1,247.* Eniwetok: 13 May 1946, *Fosberg 24,291;* observed 1949, *St. John.* Igurin: 13 May 1946, *Fosberg 24,314;* observed 1946, *Taylor,* and 1949, *St. John.* Mui: 9 August 1958, *St. John 26,320.* Rigili: 10 August 1949, *St. John 23,751.*

89. *Scaevola frutescens* (Mill.) Krause var. *sericea* (Forst. f.) Merr. "Mar Kinat." Like the species, but the foliage, white sericeous from the abundant, appressed pilosity.

Biijiri: 14 August 1949, *St. John 23,823.* Runit: 15 August 1949, *St. John 23,847.* Rigili: 1 August 1956, *Rainey.*

COMPOSITAE

90. *Erigeron bonariensis* L. *E. albidus* (Willd.) Gray. Short-lived herb, 1–2.7 m. tall, slender and unbranched to the inflorescence; canescent throughout; leaves alternate, sessile or with petioles to 3 cm. long; blades 2–10 cm. long, linear-lanceolate; panicle terminal, 20–60 cm. long, leafy; involucral bracts 4 mm. long, in 2–3 series; flowers white; achenes 1.5 mm. long, the pappus stiff. Introduced weed.

Eniwetok: 6 August 1949, *St. John 23,708.*

91. *Lactuca sativa* L. Short-lived, smooth herb, first forming a rosette with leaves 12–25 cm. long, obovate to orbicular, sessile; soft, edible; later producing a single, leafy stalk 1–1.3 m. tall; cauline leaves much smaller, auriculate and serrate; panicle terminal; heads with 12–16 yellow ray flowers; achene lenticular; pappus silky. The cultivated lettuce.

Eniwetok: in American gardens, observed 1944, *Bryan.*

92. *Pluchea indica* (L.) Less. Shrub, 0.6–2 m. tall; leaves alternate, 15–55 mm. long, oblanceolate, denticulate; cymes 2–7 cm. long, several headed; involucre 3–4 mm. high; bracts firm, in several series; flowers pink, pappus silky. Introduced weed.

Eniwetok: 6 August 1949, *St. John 23,704.*

93. *Pluchea odorata* (L.) Cass. Vigorous herb 1–3 m. tall, soft pilose; leaves alternate; petioles 0.5–2 cm. long; blades 8–15 cm. long, densely white pilose beneath; corymbs numerous, many headed; involucre 5 mm. high; flowers creamy. Introduced weed.

Eniwetok: 6 August 1949, *St. John 23,703.*

94. *Vernonia cinerea* (L.) Less. "Senailing nagailing." Short-lived herb, 20-60 cm. tall, freely branching, cinereous puberulent; petioles

0–10 mm. long; blades 2.5–3.2 cm. long, the lower ones lanceolate to obovate; the upper smaller and linear; panicle terminal; involucre 2.5 mm. long, the bracts unequal, in several series; corollas as long as the involucre, bluish; achenes 1 mm. long, the pappus white, stiff. Introduced weed.

Engebi: 4 April 1954, *Palumbo 1,123.* Eniwetok: 6 August 1949, *St. John 23,710.*

95. *Wedelia biflora* (L.) DC. "Marguegue." Arching and half-sprawling shrub; stems 2–10 m. long; leaves opposite; petioles 1–3 cm. long; blades 5–10 cm. long, lance-ovate, distantly serrate, sparsely appressed hirsutulous; peduncles terminal, mostly in 3's with 1–2 heads; involucre 4 mm. long, the bracts unequal, in several series; ray florets bright yellow, about 8, the rays 5 mm. long; disk florets numerous, each wrapped in a palea; their achenes 3 mm. long, commonly without pappus.

Engebi: observed as "yellow composite vine," 1944, *Bryan*; 18 May 1946, *Fosberg 24,391.*

96. *Zinnia elegans* Jacq. (?) Short-lived herb, 1.5–1 m. tall; leaves opposite, 2.5–5 cm. long, ovate to elliptic, hispidulous; heads solitary, 5–13 cm. across; involucral bracts round or elliptic, dark-tipped; ray flowers elliptic, of numerous rich colors; disk orange; achenes 5–6 mm. long, flattened, obovate, winged.

Eniwetok: in American gardens, observed as *"Zinnia,"* 1944, *Bryan.*

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